

Culture, Technology, Cultural Techniques – Moving Beyond Text¹

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Abstract

Originally published in 2003, this article presents one of the first attempts to provide a systematic summary of the new concept of cultural technique. It is, in essence, an extended checklist aimed at overcoming the textualist bias of traditional cultural theory by highlighting what is elided by this bias. On the one hand, to speak of cultural techniques redirects our attention to material and physical practices that all too often assume the shape of inconspicuous quotidian practices resistant to accustomed investigations of meaning. On the other hand, cultural techniques also comprise sign systems such as musical notation or arithmetical formulas located outside the domain of the hegemony of alphabetical literacy. The rise of the latter in particular is indebted to the impact of the digital – both as a domain of technology and a source of theoretical reorientation. Together, these aspects require a paradigmatic change that challenges and supersedes the traditional ‘discursivism’ of cultural theory.

Keywords

culture and discourse, cultural studies, cultural techniques, digitization, mathematics, textuality

1. For a long time, perhaps for too long, culture was seen only as text (see Lenk, 1996). Hardly any other trope has had as formative an impact on the culture-theoretical debates of the last decades as this semiotic and structuralist baseline. The metaphor of text dominated until the 1980s,

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transforming the world of culture into a world of discursive signs and referents. In that way, it helped deepen the rift between the natural sciences and the humanities and cultural sciences.

Isn't it odd, however, that the historical semantics of 'culture' (see Böhme, 1996) refers back to agrarian methods and operations and to hand-based crafts? 'Culture' has its largely prosaic origins in the tilling of a field (*cultura agri*) and in gardening work (*cultura horti*); it is first and foremost the work with things – their cultivation – that surround us on a daily basis. Indeed, Latin words such as *colere*, *culture*, and *cultura* harbor the etymological traces of a conception of culture centering around techniques and rites, skills and practices that provide for the stability of lived-in space and the continuity of time, and have thus made our world into a human world by 'cultivating' (or de-primitivizing) it (Böhme, 1996: 54). Culture contains an impulse toward action: it is what is 'done and practiced' (Busche, 2000: 70).

The evolution of the concept of culture, however, 'forgets' its genesis. Over time, the material and technical elements of culture recede further and further into the background, as the term is 'refined' into a *cultura animi* with the intention of 'spiritualizing' it. This spiritualization expresses itself in the educational values of science, art, and philosophy. All it required in the 20th century was a 'linguistic turn' (the 'discovery' of language as the pivot for the conception of ourselves and the world) to facilitate the congruence of culture and the symbolic, that is, the identification of culture with all that is semiotically given and interpretable. And so it came to pass that the procedures of textual analysis and hermeneutics advanced to become the favorite model for the understanding of cultural orders.

2. This discursivization of culture has – at least – three notable effects:
 - a. *Misjudging the epistemic power of the image.* The hierarchy between language and image, in terms of priority and import, has become indirectly proportional to the facility with which images of all kinds – photographs, film, and television – have usurped our everyday world. Practices that create images are cultural property, as long as they can be assigned to the realm of art, which is to say, as long as they are sufficiently removed from science and knowledge. Understood as the silent step-sister of language, without the potential for argumentation or, even more important, knowledge-generation, the world of pictures accrues cultural significance in the form of paintings and the mass media. The rest are illustrations...
 - b. *The disavowal of mathematical formalisms.* Those who insist on an intimate relationship with western culture acknowledge without shame that they don't want to have any truck with formulas. The fear of

formulas is almost a cultural property in and of itself, and formalism is often suspected of entailing self-alienation. When Edmund Husserl described the mathematization and formalization of the modern sciences as a crisis in the experience-ability of life, he echoed the anxieties of the European tradition of culture (see Husserl, 1970). One common view holds that where letters morph into formulas, content and interpretation go out the window; the manipulation of alphabetic and numerical signs is blocking sense and understanding. Language surrenders its symbolic power in its pact with numbers and becomes a quasi-diabolic technique.

c. The lopsided concentration of media-historical and media-theoretical research on the *relationship between orality and literacy*. Media are assigned a role in cultural history whenever they appear as ‘intralinguistic’ phenomena, that is, during the transition from speech to writing. In that way, the relationship between orality and literacy could easily be promoted to a special branch within the humanities, with the implication that writing could be understood as a purely discursive phenomenon, that is, as phonographic writing. Musical notation, the operative languages of algebraic and arithmetical formulas, logical calculus, and program ‘languages’ are all characterized by a graphism independent of sound, and thus remain outside the boundaries of the traditional concept of language-based literacy.

This ‘Abc’ of a discursive concept of culture can be reduced to a polemical formula: the direction of our changing meaning of culture goes from technique to text, from things to symbols, from processing to interpreting. And where things are the other way round – where texts function as techniques (as in the computing protocols of mathematics), where symbols reveal their manipulable materiality, and where differences in interpretation become secondary to the algorithms of operative sets – they will inevitably be suspected of being a retreat of the discourse-based concept of culture in the face of the advancing technomathematical mechanics of civilization.

3. In 1936, when Alan Turing formulated the intuitive concept of computable functions with the help of his model of a Turing machine (Turing, 1937), it was no more than a further proposition in a series of mathematically equivalent propositions coming from Gödel, Church, Kleene, Post, and Markov (see Krämer, 1988: 157). Nonetheless, his model differed from those of his mathematical rivals: it is no coincidence that Turing lent his name to the shift from the ‘Gutenberg Galaxy’ to the ‘Turing Galaxy’. Three elements of his Turing machine are central to this shift (see Krämer, 1991: 4). Turing opens up a cognitive dimension with his claim that his mathematical formalism renders explicit what a human calculator does when working with paper and pencil, which is to say,

when writing. Second, he further develops the convertibility between the symbolic and the technical already surmised by Leibniz, and along with it the convertibility between the semiotic and the physical, and, by extension, between software and hardware. And he finally projects the Turing machine as a universal medium by showing that there are universal Turing machines capable of imitating every special Turing machine because the codes of the latter can be inscribed – that is, programmed – onto the strip of the universal machine.

Thus Turing demonstrates to what degree (formal) texts can simultaneously be machines, and vice versa. The Turing machine marks the point when mind and machine are no longer at odds with one another, but acknowledge their relationship (their family resemblance, as it were). At the same time, Turing's inspirations proved incapable of softening the hardened structures of modern culture, perhaps precisely because of his use of mathematical language. In order for that to happen a discourse was required that could claim to follow in the tradition of the humanities, albeit in a culturalist guise.

4. It is indeed no longer possible to ignore the signs that the idea of culture-as-text is eroding. At the moment, we can identify at least four frontlines of this process of 'erosion':

a. *The recognition that culture-creating practices are fluid.* 'Culture' is no longer confined to what is enshrined in works, monuments, and documents in stable and statutory form. Originating in the field of language theory, the debate on 'performance' and 'performativity' has spilled over and into the social and culture sciences as well as aesthetic and art history, in the process relativizing the focus on text and representations by emphasizing the significance of cultures through acts, implementations, rituals and routines (Wirth, 2002). The English term 'cultural studies' has made everyday practices into a legitimate object of study (Böhme et al., 2000: 12). The demarcation between 'high' and 'low' culture has lost its sharply polarized distinction.

b. *Uncovering 'silent processes' of knowledge.* For a long time, science has been seen as the embodiment of theory and the search for evidence centered around a propositional and language-based form of knowledge. But recently the history of science has discovered the technical and symbolic practices (Bredekamp, 2001) housed in labs, studios, and lecture halls, which are responsible for communicating and exhibiting 'objects of knowledge' in the first place (see Bredekamp, 2003; Latour, 1989). Theories of knowledge, in turn, have shifted attention to non-propositional forms of knowledge, that is, implied and embodied knowledge manifesting and legitimating itself through the handling of objects and instruments.

c. *A willingness to de-hermeneuticize the notions of 'mind' and 'sense.'* Philologists explore the material and medial foundations of literature cultures; they reconstruct the emergence of sense out of non-sense (see Gumbrecht, 1996). The social sciences investigate communication as a social operation. Media theory, which transformed the 'linguistic turn' into a 'medial turn', reconstructs the technological dimension of media by showing that media not only communicate, they also produce what they communicate (see Kittler, 1997). The formative effects of mathematics on culture and the prehistory of the computer and computer science furthermore suggest (as envisaged by Turing) that the symbolic and the machinic relate to one another like two sides of the same coin (Krämer, 1988).

d. *The epistemological dimension of imagery.* The eye of the mind is anything but blind (see Heintz and Huber, 2001). Rather, for both the history of cognition and our practices of knowledge, visibility is anything but a merely illustrative sideshow – it constitutes the irreducible center for the research and evidentiary context of the sciences. In the emerging discipline of imagology, 'the iconology of the present' (a term coined by Horst Bredekamp and Gottfried Boehm [e.g. Boehm, 2001]), technical images are investigated precisely on the basis of their aesthetic potential as the indispensable element for the formation of scientific objectivity. While Husserl in his 'crisis statement' lamented de-sensualization and abstraction as the residue of scientific development, it on the contrary becomes clear now that it is precisely the sensualization – the aestheticization – of invisible processes and theoretical objects that are the fuel of scientific change.²

To summarize: the 'textualization' of culture has reached its limits. By transgressing those boundaries, the concept of culture assumes new contours. Culture is no longer a matter of monolithic immobility congealed in works, documents or monuments, but liquefies into our everyday practices with objects, symbols, instruments and machines. The right of exclusivity, which language used to claim for itself (with regard to representing culture), is no longer unchallenged. It is in the (inter)play with language, images, writing, and machines – in the reciprocity between the symbolic and the technical, between discourse and the iconic – that cultures emerge and reproduce.

5. Is it a coincidence that the technological phenomenon of the networked computer emerges at the intersection of the four tendencies we have just described? The computer regulates almost all productive processes; it coordinates the social communication of our society and intervenes in the production of knowledge. It manages all that precisely by having fully permeated the routines and practices of our everyday world.

It is the everyday technology for us all. As a Turing machine made real, it reveals and enacts how formalism and machine, symbol and technology, interpenetrate and how their functional processes can mutually substitute for one another. Both medium and machine, it demonstrates that the transfer of signs fundamentally depends on the technical processing as data. And the binary system as a universal digital code reminds us that the computer does not just squash the potential of writing in the flood of digitized images, but that, on the contrary, it gives it a new lease on life by bringing it back into play as the elementary vision of the technological and the machinic. Numerical simulation ushers in a form of writing which makes possible new forms of scientific visualization that, in turn, are establishing themselves as a third form of scientific practice side by side with lab work and theorization.

The use of computers has hence advanced to the level of a cultural technique. If, however, the long-term effects of computerization are in ‘the nature’ of a cultural technique, is it not advisable to subsume the varying discourses undermining a text-based notion of culture under the heading of ‘cultural technique’ and thus to endow them with a focused and programmatic direction? Cultural techniques are the hotbed of any culture. Analyzing the physiognomy of a culture means investigating its cultural techniques. *The history of culture always already is the history of its cultural techniques*, just as the history of science cannot be decoupled from the changes in the everyday techniques of perception, communication, representation, archiving, counting, measuring . . .

6. What, then, does ‘cultural technique’ signify? The agricultural origins of the term may be significant, but further elaboration is necessary. Terms that fertilize the work of various disciplines and establish relationships among them are allowed to retain a certain level of non-specificity. And yet, any analysis from the point of view of cultural techniques shares some characteristic features. As a concrete example, let us take a look at the written computations in the decimal system, a cultural technique of foundational importance for the Gutenberg era that had become canonical by the 15th century following the introduction of Indo-Arabic numbers in Europe.

Paralleling the dissemination of Indo-Arabic numbers in Europe, and their corresponding algorithms, object-based computation, as in the case of a computation board (or an abacus), gave way to computation with graphic signs on paper. However: what ‘counts’ with the numbers is that they can be manipulated following schematic rules. Computing with numbers can be realized as the operation of the sequencing of signs. The signs function as sensorial or visual markers, or as texture; they embody a structure of signification that needs to be physically produced

and manipulated in the space between the eye and the hand. For that reason, the algorithms of computation, which are not subject to interpretation, share such great affinities with technical-material practices: a computer – not to be confused with a human mathematician! – will be calculating all the more correctly the more it behaves like a machine. There is a growing divide between ‘knowing how’ and ‘knowing that’; skill and knowledge are going their separate ways. The daily use of operative signs removes the burden and complexities of interpretation. Calculus is always already a kind of ‘mechanism of forgetting’. In order to calculate correctly, we don’t need to be able to provide an answer to the question, ‘What is a zero?’ Calculating correctly does not require a theory of numbers or algorithms, and for that very reason ushers in an unforeseen explosion of mathematical competence in daily life: computing with Indian numbers is no longer the exclusive privilege of ecclesiastical and academic circles but enters the world of merchants and the curricula of general education: thank God for Adam Riese! (Ries, 1892; see also Menninger, 1979, II: 254).

Written computation, however, does not only lodge itself in the practices of everyday life and change what ‘everybody’ can do. Almost all the major mathematical breakthroughs in the 16th and 17th centuries bear witness to the ingenuity of the decimal calculus, which is grounded in the algorithmic operations of signs for numbers. That is true for the introduction of letter-based computation through François Viète, who prepared the way for symbolic algebra by transferring computation with numbers to alphabetic signs and hence generalized algebraic rules in writable form (Viète, 1970). That is true of René Descartes, who by recoding geometrical figures into arithmetical sequences of numbers founded analytical geometry (Descartes, 1981). And it is true for Gottfried Wilhelm Leibniz’s infinitesimal calculus, which translates the efficiency of the decimal calculus with finite numbers into the range of numbers infinitely large and small (Leibniz, 1846). In so doing, he rendered mute the vexing question of whether or not infinitely large and small numbers exist in actuality in executing correct calculations about these numbers. And it was Leibniz who, with the invention of the binary alphabet, spelled out ‘the spirit of calculus’ as the effect of a symbolic machine (Leibniz, 1966). Moreover, the physical manipulation with calculable signs also gives birth to new, that is, theoretical, objects: the evolution of the number zero is a case in point, as are such mathematical objects as differential equations or imaginary numbers. On the one hand, the aesthetic of calculus is such that it ‘feeds’ entities into the register of sensory perception that would otherwise be cognitively invisible; at the same time, however, such an aesthetic produces and constitutes these kinds of ‘objects’ at the moment of their visualization in the first place.

In conclusion, cultural techniques are promoting the achievements of intelligence through the senses and the externalizing operationalization

of thought processes. Cognition does not remain locked up in any invisible interiority; on the contrary, intelligence and spirit advance to become a kind of distributive, and hence collective, phenomenon that is determined by the hands-on contact humans have with things and symbolic and technical artifacts.

7. Let's recapitulate the outlines of the cultural-technical perspective: cultural techniques are (a) operative processes that enable work with things and symbols; (b) they are based on a separation between an implied 'know how' and an explicit 'know that'; (c) they can be understood as skills that habituate and regularize the body's movements and that express themselves in everyday fluid practices; (d) at the same time, such techniques can provide the aesthetic and material-technical foundation for scientific innovation and new theoretical objects; (e) the media innovations accruing in the wake of changing cultural techniques are located in a reciprocity of print and image, sound and number, which, in turn; (f) opens up new exploratory spaces for perception, communication, and cognition; and (g) these exploratory spaces come into view where disciplinary boundaries become permeable and lay bare phenomena and relationships whose profile precisely does *not* coincide with the boundaries of specific disciplines.

Translated by Michael Wutz

Notes

1. This article was previously published as: 'Kultur, Technik, Kulturtechnik: Wider die Diskursivierung der Kultur', in Krämer S and Bredekamp H (eds) *Bild, Schrift, Zahl*. Munich: Fink, 2003, pp. 11–22.
2. '... we must make clear to ourselves the *strangeness* ... that everything which manifests itself as real through the specific sense qualities must have its *mathematical index*. ... The whole of infinite nature, taken as a concrete universe of causality – for this was inherent in that strange conception – became [the object] of a *peculiarly applied mathematics*' (Husserl, 1970: 37).

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